5. ENVIRONMENTAL IMPACTS/EFFECTS

Section 519 of Water Resources Development Act (WRDA) 2000 defines the Illinois River Basin as the Illinois River, Illinois, its backwaters, its side channels, and all tributaries, including their watersheds, draining into the Illinois River. Small portions of this program area are located outside the Illinois State boundaries, and include an area in extreme southeastern Wisconsin and the northeastern corner of Indiana. The original coordination efforts for this project did not include any area outside the boundaries of Illinois. In the event that future projects associated with this Comprehensive Plan are proposed for these two areas outside Illinois, individual coordination with appropriate Federal and State agencies would be required for compliance with National Environmental Policy Act (NEPA) and other Federal laws and policies applicable to all plans recommended for implementation.

The NEPA documentation and required coordination for this systemic program are documented in the integrated Environmental Assessment (EA) within this report. Subsequent NEPA documentation and coordination, whether the project occurs within or outside the State of Illinois, will be represented by individual, site-specific EAs and will be compiled for all future ecosystem restoration projects after they have been identified.

This systemic ecosystem restoration program would result in positive impacts to numerous aspects/components of the environment.

SYSTEM RECOMMENDATIONS

A. Environmental Impacts of the Selected Alternative

1. Natural Resources. Basic to all ecosystem restoration projects is the premise that ecological integrity would improve if the project(s) were to be implemented. In some cases, this improvement could be represented by simply slowing the rate of ecological decline. Implementation of the recommended alternative for this program (Alternative 6) represents a level of restoration that would provide a measurable increase in the level of ecological integrity at the system level, moving towards the desired future condition, in the most cost-effective manner.

All types of projects, including ecosystem restoration, result in the alteration or conversion of one habitat type to another. When this happens, invariably, some organisms benefit to the detriment of others. This trade-off is inevitable whether this conversion is the result of natural processes or human induced ones, such as this program. Such a trade-off could be illustrated by an example where a historically deep backwater lake has filled in over the years and become a willow thicket with only a very small, shallow, ephemeral open water portion. Beavers and shore birds could be negatively impacted if the backwater was deepened. These two species could be replaced by fish and waterfowl. The inevitable trade-offs that would result from implementation of this program is considered to be beneficial over-all to restoring and maintaining ecological integrity and the processes that maintain them.

Because of the tiered nature of this systemic program and the associated, somewhat generic analysis, there is not enough detailed information available at this time to fully evaluate site-specific impacts to natural resources resulting from implementation and construction of management measures specific to

each future project. Important, sensitive resources that may be adversely affected by construction include, but are not limited to, fisheries, mussel assemblages, Federal and State endangered and threatened species, bottomland forests, wetlands, rookeries, fish spawning areas, and recreational use areas. Despite this potential adverse impact from construction activities, the overall impact to ecological components, both biotic and abiotic, would improve through time.

This Comprehensive Plan describes preliminary assessments for natural resources that may be impacted by this systemic program. Impacts to resources will be investigated in greater detail when EAs are conducted for each site prior to construction. Additional habitat analysis, hydraulic modeling, endangered and/or threatened species evaluations, mussel surveys, fishery impact assessments, recreation impact assessments, and contaminant risk assessments will be needed to fill data gaps. Interagency coordination and cooperation will be required during completion of each EA so that impacts of concern can be properly recognized and evaluated and appropriate measures to reduce potential impacts can be identified and implemented, if warranted.

The intent of any ecosystem restoration program and project is to improve the environment compared to the future without project condition. Implementation of the preferred alternative for this program would accomplish that. This is illustrated in figure 5-1 as a line graph depicting trends in ecological integrity in the Illinois River Basin through time, including a prediction of the trend if Alternative 6 were to be implemented to the full funding level recommended. Alternative 6 is the first alternative where significant increases in sustainability of ecological processes and functions are anticipated.

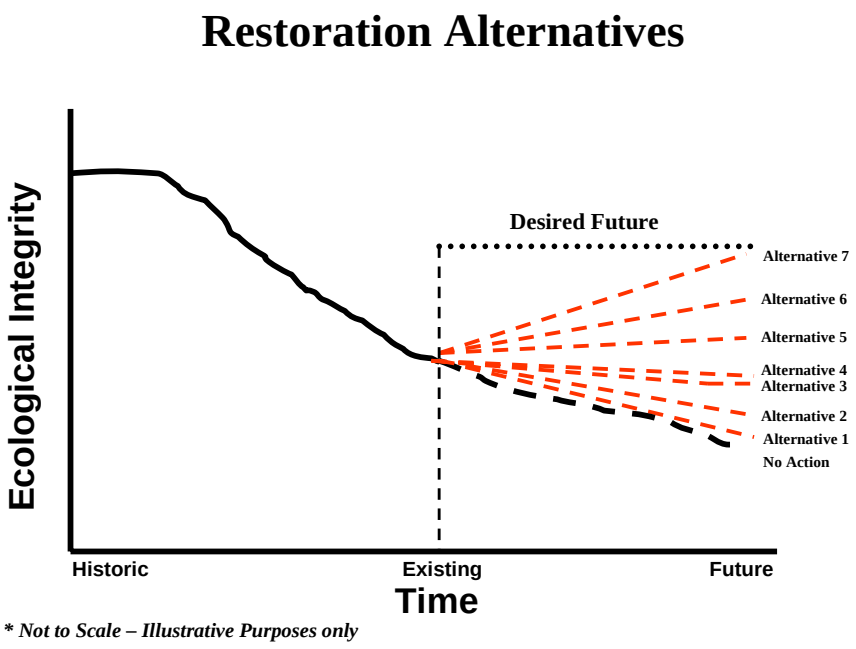

Figure 5-1. Conceptual Restoration Benefits of Alternatives

As discussed earlier in this Comprehensive Plan, Section 3, *Plan Formulation*, subsections E through K, the individual goal write-ups list species or groups of organisms that would benefit from implementation

of the great variety of management measures intended to achieve each goal. These are the types of natural resource components that would be impacted (positively) from implementation of Alternative 6.

2. Threatened and Endangered Species. Only when future site-specific ecosystem restoration projects and their associated EAs are identified by specific location, magnitude, and objectives, with details on the management measures proposed to meet the objectives, will it be possible to identify which sensitive resource (e.g., wetlands, backwater lakes, threatened and endangered species, natural areas, high quality woodlands, mussel populations, bat roost trees, etc.) may be impacted and how to avoid or minimize impacts to those resources. This systemic ecosystem restoration program should lead to improved conditions for sensitive resources.

The U. S. Fish and Wildlife Service (USFWS) responded to the District's NEPA coordination letter by listing the current distribution of federally-listed threatened and endangered species in Illinois. This initial coordination response did not provide information on federally-listed species in Indiana or Wisconsin that occur within the Illinois River Basin. From that information on Illinois, the following subset of species could occur in the Illinois River Basin: bald eagle, gray bat, Indiana bat, Higgins' eye pearly mussel, clubshell mussel, prairie bush clover, leafy prairie clover, lakeside daisy, Mead's milkweed, decurrent false aster, eastern prairie fringed orchid, Pitcher's thistle, Hine's emerald dragonfly, Karner blue butterfly, and eastern massasauga rattlesnake. Some of these species would have a low to nonexistent likelihood of being impacted by any future site-specific ecosystem restoration project under this systemic program (e.g., Pitcher's thistle, Karner blue butterfly, Higgins' eye pearly mussel, Mead's milkweed). Direct actions/activities of this program are not likely to negatively impact any federally-listed threatened or endangered species.

In the Final Coordination Act Report (CAR) dated May 2004, the USFWS states the District must complete a programmatic Biological Assessment (BA) to comply with the Endangered Species Act (ESA). The CAR states the District has chosen to fulfill ESA Section 7 consultation with a programmatic BA at some point following authorization of the Illinois River Ecosystem Restoration Study (IRERS). Following extensive discussion within the District, and following the receipt of a letter from the USFWS, dated August 10, 2005 (see Section 7.B.), on this subject, the District has decided that completion of a programmatic BA would not be the most efficient way to satisfy ESA Section 7 compliance for this project.

Biological Assessments are intended to help Action Agencies (in this case the Rock Island, Chicago, Detroit, and St. Louis Districts) if a formal consultation with the USFWS is necessary. Biological Assessments also help to determine if a proposed action is likely to adversely affect a listed species or critical habitat. Formal consultations determine whether a project is likely to jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat. Biological Assessments are required for early consultations on prospective projects that are major construction activities, which are defined as construction projects which are major Federal actions significantly affecting the quality of the human environment.

The general investigation Comprehensive Plan for the Illinois River Basin Restoration cannot yet identify future specific restoration project locations; specific restoration project goals, the nature and extent of the specific restoration activity. The District believes this lack of site specific project details makes the completion of a programmatic BA of limited utility. Because of this inability, at this time, to package specific suites of activities, the District believes the most effective and efficient way to accomplish compliance with the ESA for the IRERS is to complete site specific and species specific

BAs when enough information on specific ecosystem restoration project locations and restoration measures have been finalized. These species specific BAs would be completed before any contract for construction is entered into and before construction is begun. These BAs would accompany future site specific Environmental Assessments.

The Coordination Act Report from the USFWS for this project can be seen in appendix G of this report and the conclusions and recommendations are reproduced here:

Conclusions

- The Illinois River ecosystem has been so severely degraded by human activities during the last 100 years that its ecological integrity and ability to recover from disturbance have been greatly diminished. Sedimentation problems continue to pose serious threats to backwater areas in the lower pools that currently provide habitat for a number of fish and wildlife species. A collaborative and adaptive management strategy involving implementation of conservation measures, rehabilitation projects, and long-term monitoring is needed to improve the condition of this ecosystem. Management decisions and actions at both the watershed and more localized levels will ultimately determine the future fate of this once highly productive river resource.

- In cooperation with the Illinois Department of Natural Resources (DNR), we believe that the Corps has done a good job of identifying system-wide environmental needs and establishing an implementation process to address many of these issues. However, significant coordination is still needed to establish the appropriate level of government, non-government, and private cooperation to successfully restore the Illinois River Basin.

- Because of sedimentation and human-induced alterations to the floodplain ecosystem, aquatic and terrestrial habitats throughout the Illinois River will continue to decline at spatially variable and largely unquantified rates. Prioritization schemes should be implemented at the project fact sheet level to insure that limited dollars are applied most efficiently.

- The main channel of the Illinois River will remain stable, but backwaters will continue to decline from sedimentation. In coordination with the Navigation Study and EMP restoration efforts, critical backwater areas within each pool should be identified and restored as expeditiously as possible.

- Main channel fish populations are expected to remain healthy, but fish species requiring backwater habitats for any life requirements will likely decline. An anticipated rapid response to backwater restoration efforts will likely be seen among fish guilds requiring backwater habitat.

- During the fall, State natural resource agencies, the USFWS national wildlife refuges, and many privately-owned duck clubs artificially manipulate water levels in several management areas along the Illinois River. These moist soil units enhance growth of aquatic vegetation and supplement natural sources of food. Unmanaged backwater areas that currently provide dabbling duck food resources are likely to decline in future years as

backwaters diminish. There may be opportunities to work with private landowners and establish partnerships to enhance the management of these areas and potentially the integrity of the Illinois River.

- The quality of bottomland hardwood forest habitat will decline. Associated species that depend upon mast and mature/over-mature stands will decline due to lack of regeneration.

- As they are currently funded or structured, we do not believe that the current ecosystem restoration efforts within the basin can reverse the system-wide decline in fish and wildlife habitat without a more intense coordination among agencies. Future IL 519, EMP, Navigation Study, etc., habitat projects must be able to address the systemic driving variables as well as the localized symptoms of habitat decline.

Recommendations

- All management actions (both Federal and State) such as those implemented under EMP, IL 519, Navigation Study, USDA, USFWS and other restoration efforts along the main stem of the Illinois River and the main stem floodplain need to be coordinated with one another to ensure efficient and successful management of the Illinois River Basin. This coordination may be best met through specific institutional arrangements and the formation of a management triad consisting of: (1) River Council, (2) Science Team, and (3) Regional Management Team.

- Several similar recommendations have become apparent during the coordination of this project and in light of strides made by the Upper Mississippi River-Illinois Waterway (UMR-IWW) System Navigation Study to implement environmental restoration as a key component of that study's alternative matrix. It is strongly recommended that the IL 519 and the Navigation Study be more closely coordinated with one another and potentially integrated as part of each another. Much like the Mississippi River, the Illinois River has paid a significant environmental price for structures that allow and improve navigation. Environmental alternatives that mitigate navigation impacts on the Illinois River need to be coordinated with projects funded through the IL 519 authorization.

- As the primary regulator of Section 404 permits, the Regulatory Branch of the Rock Island District plays an important role in the success of this restoration initiative. It appears that many beneficial projects could be targeted through contacts made by the Regulatory Branch through Section 404 permit applications. Interested and willing landowners could be directed to contact key members of regional teams for assistance in projects such as stream restoration (as opposed to channelization) or wetland protection (as opposed to draining). Wetland, stream, and forest mitigation as outlined in the Corps recent "draft mitigation guidelines" could be emphasized for the most important areas within each tributary watershed of the Illinois River Basin.

- We encourage the Corps to investigate opportunities to assist in the funding of specific U.S. Department of Agriculture-type programs where landowner contacts have been made and prime project sites are identified to address one or more of the seven environmental restoration goals. In addition to government-led efforts, there may also be

opportunities to work with various non-government organizations to accomplish many of the basin goals as well. These types of partnerships could reduce planning efforts and present more efficient "on the ground" projects.

- Alternative features, predominantly regarding sediment reduction techniques, which are untested for their ecological integrity function (i.e., riffle structures, bendway weirs, etc.) should be implemented through a cautious and scientific approach to identify ecological reactions. Opportunities should be sought to collaborate with state and/or private universities to study the biological interactions of these features.

- Adaptive management techniques should be established that would allow the Corps and the Illinois DNR to redirect focus of the IL 519 authority if future conditions of the Illinois River turn out to be less desirable than predicted, especially regarding sediment delivery assumptions into the Illinois River Basin.

3. Historic Properties. Archeological site and survey geographic information systems (GIS) data were queried in order to summarize the study area within the State of Illinois by county (table 5-1). GIS historic properties by county for the States of Wisconsin and Indiana were not available for this Comprehensive Plan. Therefore, site location data for historic properties within these states will be provided on a case-by-case, site-specific project basis.

As of May 2004, there were 24,808 previously recorded archeological sites within the study area in Illinois. Approximately 4,800 separate surveys have been conducted over an area covering approximately 984,000 acres or roughly 6.2 percent of the study area. Data concerning cultural affiliation and archeological site types are available for more than 23,000 of the recorded sites. Cultural components span the entire known occupation of North America including Paleo Indian through Historic Native American and Euro American traditions. A brief cultural history for the Illinois River Basin, focusing on the Illinois River Valley, can be found in appendix I, *Cultural History*. Documented archeological site types include prehistoric mounds and rock shelters, prehistoric/historic period habitations, cemeteries, and burials, and historic period farmsteads, industrial/commercial complexes, schools, and churches.

Since 6.2 percent of the study area contains 24,808 previously recorded archeological sites, the potential for undocumented archeological sites in the unsurveyed portion of the study area is expected to be relatively high, although it varies considerably according to landscape position and associated landform sediment assemblage (LSA) unit. Research conducted for the Corps in support of the operation and maintenance of the Illinois Waterway project has defined and mapped LSA units covering approximately 787,000 acres of the current study area (table 5-2). LSA units are geologic features that define Late Wisconsinan and Holocene alluvial fills. Each LSA unit has an ordered structure of development with predictable ages that have proven effective in determining the likelihood for near-surface and/or deeply buried archeological sites.

In general, approximately one archeological site has been documented for every 76 acres of land that has been surveyed within the LSA subset of the study area. The totals differ somewhat between landscape categories and component LSA units. Table 5-2 illustrates this range of variability.

Clearly greater site frequencies are documented for LSAs like alluvial fans (1 site per 43 acres), colluvial slopes (1 site per 22 acres), and Bath terraces (1 site per 50 ac) over other LSAs such as crevasse splays (1 site per 142 acres) or paleochannels (1 site per 151 acres). Likewise landscape site frequencies suggest a settlement preference for eolian (1 site per 31 acres), valley margin (1 site per 41 acres), and catastrophic flood landscapes (1 site per 57 acres) over floodplain landscapes (1 site per 205 acres). These numbers most likely reflect a settlement preference for certain higher, drier landforms, although this may be misleading. The higher numbers may have been augmented by the fact that these landforms have limited deposits of recent alluvium so that sites are more easily discovered near the present ground surface using traditional archeological surface survey techniques.

Conversely, the lower site frequencies for other landforms may be due in part to improper surface surveys conducted over deep recent alluvial deposits. The LSA model underscores the fact that geomorphological analysis is necessary both to assess the archeological potential of a given landform within the study area and to identify the proper field investigation technique for archeological site discovery.

Table 5-1. Summary Archeological Survey and Site Frequency Data Identified by All Counties Within the Study Area (2004 data)

Illinois County	County Acreage in Study Area	Archeological Surveys*	Acreage Surveyed	Percentage Surveyed	Recorded Archeological Sites**
Adams	163469	44	4783	2.9%	98
Brown	196647	58	18197	9.3%	441
Bureau	389658	39	11648	3.0%	184
Calhoun	81394	29	3488	4.3%	319
Cass	246027	91	9920	4.0%	912
Champion	146558	26	1202	0.8%	95
Christian	444382	68	15443	3.5%	456
Cook	587244	541	52060	8.9%	957
Dekalb	149203	11	400	0.3%	32
Dewitt	259766	33	1159	0.4%	382
Dupage	215998	393	31014	14.4%	479
Ford	192947	4	366	0.2%	26
Fulton	565307	241	40080	7.1%	2984
Greene	350228	105	69898	20.0%	617
Grundy	276326	129	36809	13.3%	260
Hancock	232347	44	7626	3.3%	518
Henderson	9855	0	0	0.0%	1
Henry	35521	6	576	1.6%	7
Iroquois	701838	18	1124	0.2%	208
Jersey	174168	50	11037	6.3%	368
Kane	243448	422	45657	18.8%	654
Kankakee	434009	103	14737	3.4%	550
Kendall	206861	210	56558	27.3%	469
Knoz	378563	20	877	0.2%	217
Lake	264366	649	48596	18.4%	605
Lasalle	736359	176	22145	3.0%	979
Lee	57876	0	0	0.0%	4
Livingston	661688	30	2166	0.3%	165
Logan	395386	42	1132	0.3%	452
Macon	363417	67	5879	1.6%	222
Macoupin	424162	66	31998	7.5%	247
Marshall	255688	40	5693	2.2%	173
Mason	360456	41	5611	1.6%	244
Mcdonough	377668	130	18928	5.0%	1163
Mchenry	195639	225	23298	11.9%	231
Mclean	760918	134	14387	1.9%	440
Menard	202651	50	4305	2.1%	181
Montgomery	86452	12	548	0.6%	37
Morgan	366877	124	23759	6.5%	377
Moultrie	44	0	0	0.0%	0
Peoria	403627	132	27898	6.9%	570
Piatt	170578	20	1124	0.7%	209
Pike	173998	57	18084	10.4%	666
Putnam	110353	17	1606	1.5%	65
Sangamon	562459	278	32161	5.7%	1292
Schuyler	282539	103	29959	10.6%	1111
Scott	161846	32	65145	40.3%	438
Shelby	56361	13	530	0.9%	23
Stark	184786	1	4	0.0%	32
Tazewell	421704	95	7252	1.7%	430
Vermillion	34350	1	20	0.1%	1
Warren	147808	5	71	0.0%	86
Will	542776	1096	146805	27.0%	2761
Woodford	347963	35	10578	3.0%	370
Total	15792558	6356*	984339	6.2%	24808**

* Some surveys include multiple counties, so only the individual survey counts by county are accurate.

** Archeological site totals include all sites recorded in the study area, many of which fall outside of the surveyed areas represented in this table.

Table 5-2. Summary Archeological Site Frequency Data Identified by Landscape Category and Landform Sediment Assemblage Unit Within the Illinois Waterway Portion of the Study Area (based on Hajic, 2000)

LANDFORM SEDIMENT ASSEMBLAGE (LSA) UNITS	ILLINOIS WATERWAY LANDSCAPE CATEGORIES														GRAND TOTAL BY LSA UNIT		AVERAGE SURVEYED ACREAGE PER ARCHEOLOGICAL SITE BY LSA UNIT
	CATASTROPHIC FLOOD		DISTURBED AREAS		EOLIAN		FLOODPLAIN		VALLEY MARGIN		TRIBUTARY		VALLEY TERRACE				
	Sites	Acreage Surveyed	Sites	Acreage Surveyed	Sites	Acreage Surveyed	Sites	Acreage Surveyed	Sites	Acreage Surveyed	Sites	Acreage Surveyed	Sites	Acreage Surveyed	Sites	Acreage Surveyed	
Alluvial Fan	0	0	0	0	0	0	0	0	212	8932	0	111	0	0	212	9043	43
Bar	32	3359	0	0	0	0	5	240	0	0	0	0	0	0	37	3599	97
Colluvial Slope	0	0	0	0	0	0	0	0	12	268	0	0	1	12	13	280	22
Channel Belt	0	0	0	0	0	0	0	0	0	0	68	4800	0	0	68	4800	71
Crevasse Splay	0	0	0	0	0	0	3	409	0	0	0	17	0	0	3	426	142
Dune	0	0	0	0	7	215	0	20	0	0	0	152			7	387	55
Erosional Residual	92	3861	0	0	0	0	0	0	0	0	0	0	0	0	92	3861	42
Floodplain Undifferentiated	0	0	0	0	0	0	8	594	0	0	20	1378	0	0	28	1972	70
Floodplain, Type B	0	0	0	0	0	0	1	325	0	0	0	0	0	0	1	325	325
Floodplain, Type C	0	0	0	0	0	0	5	546	0	0	0	0	0	0	5	546	109
Floodplain, Type D	0	0	0	0	0	0	9	1689	0	0	0	0	0	0	9	1689	188
Floodplain, Type E	0	0	0	0	0	0	12	1644	0	0	0	0	0	0	12	1644	137
Floodplain, Type S	0	0	0	0	0	0	6	391	0	0	0	0	0	0	6	391	65
Island	0	0	0	0	0	0	0	38	0	0	0	0	0	0	0	38	#DIV/0!
Floodplain Lake	0	47	0	106	0	0	2	6804	0	0	0	55	0	2	2	7014	3507
Marginal Channel	133	7525	0	0	0	0	0	0	0	0	0	0	0	0	133	7525	57
Natural Levee	0	0	0	0	0	0	35	4639	0	0	0	34	0	0	35	4674	134
Overbank Belt	0	0	0	0	0	0	0	0	0	0	12	1307	0	0	12	1307	109
Paleochannel	2	575	0	0	0	0	1	36	0	0	5	578	0	24	8	1212	151
Active River Channel	0	0	0	0	0	0	5	1477	0	0	0	0	0	0	5	1477	295
Strath Terrace	27	2129	0	0	0	0	0	0	0	0	3	51	0	0	30	2180	73
Bath Terrace (Youngest)	138	6816	0	0	0	0	0	0	0	0	21	682	5	690	164	8188	50
Manito Terrace (Next Youngest)	10	539	0	0	0	0	0	0	0	0	0	0	3	74	13	613	47
Unknown	0	0	6	5286	0	0	0	0	0	0	0	0	0	0	6	5286	881
GRAND TOTAL BY LANDSCAPE CATEGORY	434	24852	6	5392	7	215	92	18853	224	9200	129	9165	9	802	901	68479	76
AVERAGE SURVEYED ACREAGE PER ARCHEOLOGICAL SITE BY LANDSCAPE CATEGORY	57		899		31		205		41		71		89		76		

Architectural sites (exposed "above ground" superstructures or components versus "buried" archeological sites) within the Illinois River Basin are extremely common, varied, and important in the cultural history representing the occupation of the program area (appendix I). Architectural sites are predominately European or Euro-American and consist of buildings, structures, complexes, and districts.

Architectural historic properties can also exist as remnants of water retention dams and other early hydropower structures. The Illinois Waterway (IWW), as well as many of its tributaries, exhibit navigational and hydroelectric structures important to 19th and 20th century commerce. The present IWW system 9-foot Navigation System was initiated when Congress passed the River and Harbor Act of 1927 that authorized funds for its improvement from Utica, Illinois to St. Louis, Missouri. This legislation was modified in 1930 to include the State of Illinois initiated project from Utica to Lockport, and further modified in 1935 to increase the lower portion to its present 300-foot width. Extending for approximately 333 miles, the IWW links Lake Michigan with the Mississippi River and connects with the Atlantic Ocean via the Great Lake Region, St. Lawrence Seaway, and Inland Coastal Waterway. The IWW extends from the mouth of the Chicago River on Lake Michigan, then proceeds through the Chicago Sanitary and Ship Canal, the lower Des Plaines River, and the Illinois River to the Mississippi River at Grafton, Illinois. The Chicago Sanitary and Ship Canal, with a depth of 22 feet, was completed in 1900. Cal Sag Channel was completed in 1922 and later modified, including widening in 1960. Its Calumet channel branches southeast from the waterway and provides an important link with the Calumet industrial region along the Illinois-Indiana border. Principal cargoes carried by barges are coal, petroleum, and grain products. The IWW system has long been identified as a significant system relative to the historical, engineering, and economical development of the State of Illinois and City of Chicago, as well as to the nation.

Adjacent to the IWW, the Illinois and Michigan Canal was designated as a National Historic Landmark in January 1964 and listed on the National Register of Historic Places in October 1966. The Illinois and Michigan Canal was designated the Illinois and Michigan Heritage Canal Corridor in 1984. T. J. O'Brien Lock, the Chicago Sanitary and Ship Canal, Lockport Lock, Brandon Road Lock and Dam, Dresden Island Lock and Dam, Marseilles Lock, Dam, and Canal, and Starved Rock Lock and Dam are within the canal corridor boundaries.

In July 1993, the Illinois Historic Preservation Agency (IHPA) and the Rock Island District Corps of Engineers (Rock Island District) determined that portions of the IWW Navigation Channel, from mile 80.2 to 327.0, were eligible for listing on the National Register of Historic Places. In October 1996, the Rock Island District surveyed 331 buildings and structures and identified eight historic districts, eligible to the National Register of Historic Places (NRHP) as the "Multiple Property Chicago to Grafton, Illinois, Navigable Water Link, 1839-1945." The Corps' *Architectural and Engineering Resources of the Illinois Waterway Between 130th Street in Chicago and La Grange, Volumes I and II,* documents the 72 contributing resources within the 8 historic districts, consisting of the seven lock and dam facilities and the Illinois Waterway Project Office.

As part of the recently completed Navigation Study, the final NRHP Nomination Registration Form was accepted by the Illinois Historic Preservation Agency in January 2002. The significant portions of the IWW are formally designated as the "Historic Resources of the Illinois Waterway Navigation System, 1808-1951." With the endorsement of Corps Washington Headquarters, the Historic Resources of the Illinois Waterway Navigation System, 1808-1951 nomination forms have been formally submitted to the National Park Service for evaluation and listing.

Submerged historic properties are completely or partially inundated during most of the year. These can include structures, boats and other water vessels, water retention dams, prehistoric and historic occupations, and other sites typically found at terrestrial, archeology sites. Typically, the submerged historic properties cannot always be accurately located within the IWW by documentation alone, but often require remote sensing methods and underwater testing. For a list of documented submerged shipwrecks, see table 5-3.

The Corps and the Illinois DNR have determined that implementation of the Illinois River Basin Restoration may have an effect upon archeological, architectural and/or submerged properties listed on, or eligible for listing on, the NRHP, and consulted with the Advisory Council on Historic Preservation (ACHP), the State Historic Preservation Officer (SHPO), and other consulting parties, as required by Section 106 and Section 110 of the NHPA. The Corps and the Illinois DNR have previously invited the SHPO, ACHP, Tribal Historic Preservation Officers (THPOs), and any other interested parties to participate in the consultation process and in the development of a Programmatic Agreement (PA) for the Illinois River Basin Restoration. There is the potential for adverse effects to significant historic properties and cultural resources. Such effects would be mitigated under the stipulations of the executed *Programmatic Agreement Among the Chicago, Rock Island, and St. Louis Districts of the U.S. Army Corps of Engineers, the State of Illinois Department of Natural Resources, the Illinois State Historic Preservation Officer, and the Advisory Council on Historic Preservation, Regarding Implementation of the Illinois River Ecosystem Restoration* (appendix A). A copy of the PA will be included in all NEPA reports and referenced in appropriate correspondence. If program activities occur which have the potential to affect historic properties as indicated by previously reported sites or documented research, the Corps will conduct a survey in accordance and coordinate with the appropriate State Historic Preservation Officer and other consulting parties promulgated under the NHPA.

Table 5-3. Submerged Boat Sites on the Illinois Waterway (Custer and Custer 1997:163).

Name	Mile	Location	Disposition	Disposition Date
America	Unknown	Unknown	Snagged	1836
Jessie Bill	88.5	Beardstown	Wrecked	1906
Alphonse de	110.5	Bath	Burned	1849
Beardstown	110.5	Bath	Exploded	1854
Young America	112	Bath	Snagged	1855
Minnesota Belle	128	Liverpool	Snagged	1862
Obion	128	Liverpool	Collision	1856
Tuttle	145	Kingston Mines	Wrecked	1918
Wyoming	152.8	Pekin	Burned	1853
Prairie State	152.9	Pekin	Exploded	1852
Columbia	159.5	Kickapoo Bend	Sank	1918
Emma Harmon	162	Peoria	Ice	1857
Helen Mar	162	Peoria	Exploded	1836
Illinoian	162	Peoria	Snagged	1836
Avalanche	162	Peoria	Burned	1853
Birdie B.	162	Peoria	Lost	1920
Celeste	162	Peoria	Abandoned	1924
Duchess	162	Peoria	Abandoned	1925
Fox	162	Peoria	Foundered	1920
Jennie	162	Peoria	Burned	1922
Nettie	162	Peoria	Abandoned	1925
Nina	162	Peoria	Abandoned	1920
Peoria	162	Peoria	Snagged	1834
Revenue	162	Peoria	Burned	1847
Fred Swain	166	Averyville	Burned	1909
Peerless	172	Mossville	Foundered	1911
Beder	189.2	Lacon	Burned	1918
Wave	222.5	Peru	Burned	1837
Revolution	223	Peru	Burned	1849
R. M. Bishop	223	Peru	Snagged	1867
D & G	243.5	Ottawa	Burned	1932
Altair	252.7	Seneca	Sank	1943
E. S. Conway	293	Lockport	Collision	1938
Andy Wood	293.5	Lockport	Sank	1917
Luster Loomis	301.5	Lemont	Burned	1913
Carrie A. Ryerson	308.9	Willow Springs	Burned	1921
B & C	315.5	Summit	Collision	1912
James Hay	318.5	Chicago	Burned	1925
Coyote	324.8	Chicago	Lost	1921
Lobo	325	Chicago	Burned	1919
Red Crown 2	325	Chicago	Lost	1923
China	325.6	Chicago	Sank	1896
Doris	325.8	Chicago	Burned	1934
Dispatch Boat #1	326	Chicago	Exploded	1935
Harvey	326	Chicago	Burned	1925
Oscar F. Mager	326	Chicago	Collision	1925
Rembha	326.8	Chicago	Sank	1917
D'Artagnan	330.8	Chicago	Lost	1920

4. Created Resources. The proposed program area is almost entirely influenced by humankind, in one fashion or another. Most of the area may be considered a created resource since it is natural resources modified by humans, for a variety of purposes. The Illinois River Basin has been modified and/or used for a myriad of reasons, including but not limited to: commercial waterborne transportation, locks, dams, and regulating structures for navigation; refuges for fish and wildlife management; levees and riprapping for food production and erosion control; highway and railroad embankments, as well as bridges, for transportation; beaches and marinas for recreation; cities; barge terminals; land use changes for urban and agricultural uses; and an endless list of activities designed to provide people with a place to live, work, and play in the basin.

Future ecosystem restoration projects will likely entail impacting some aspect of created resources, whether they involve manipulation of the dams, channel regulating structures, agricultural fields, levees, etc. Those future projects will more specifically identify which aspect of all the created resources could be impacted based on the location, magnitude, and extent of management measures proposed for each project. Some of these physical resources may overlap with historic properties. These potential impacts would be assessed in future site-specific, project planning documents with NEPA compliance.

B. Socioeconomic Effects Recommended Ecosystem Restoration Alternative 6

This assessment addresses the anticipated basin-wide socioeconomic impacts of the recommended Ecosystem Restoration Alternative 6 in support of the study vision for "a naturally diverse and productive Illinois River Basin that is sustainable by natural ecological processes and managed to provide for compatible social and economic activities." The scope of this social assessment covers the 50-year planning horizon for implementation of the recommended measures and is intended to provide decision-makers with information regarding the various potential basin-wide impacts that could occur as a result of the proposed preferred Ecosystem Restoration Alternative 6. Alternative 6 includes measures that would address restoration needs over the entire 50-year period of analysis. The cost estimate based on an initial 6-year implementation period would invest $153.85 million in ecosystem restoration increasing to $384.6 million over 11 years, bringing corresponding economic and social benefits to areas throughout the region.

Alternative 6 includes six goals for restoration, preservation, and protection of the ecosystem of the Illinois River Basin, under the Overarching Goal to restore and maintain ecological integrity: (1) reduce sediment delivery; (2) restore backwaters and side channels; (3) restore floodplain and riparian habitats; (4) increase fish passage; (5) improve water level management; and (6) improve water and sediment quality. The following is a discussion of potential socioeconomic impacts that could occur following the implementation of the restoration measures recommended in Alternative 6.

1. Community and Regional Growth. No significant long-term impacts to the growth of the community or region would be expected to result from implementation of the recommended alternative. For the measures that would involve some type of construction, be it small or large projects, there would be direct construction expenditures resulting in indirect impacts in the economy of the river basin. However, most of the construction benefits would be site-specific as they would accrue to the cities or counties located adjacent to the construction sites.

2. Community Cohesion. Overall, no significant adverse impacts on community cohesion throughout the river corridor would be expected from the environmental restoration measures in Alternative 6. Environmental restoration would not result in permanent changes to the population of any community, segment, or separate parts of the communities or neighborhoods; change income distribution; cause relocation of residents; or significantly alter the quality of life.

The proposed environmental restoration measures could positively impact community cohesion by attracting visitors and recreationists from other communities to the restored wildlife areas. The potential increase in recreation activities would not adversely impact area property owners. As stated in the Executive Summary for this Comprehensive Plan, the acquisition of lands, easements, and rights-of-way would only be obtained from willing landowners, thereby avoiding adverse impacts. No significant public opposition to the enhancement measures would be anticipated on a basin-wide level.

Any further assessment of specific impacts to urban policy resulting from ecosystem restoration would be addressed in a site-specific analysis.

3. Displacement of People. On a systemic basis, displacement of people is not a significant issue. Residential relocations are not expected to occur in any of the areas involved with the restoration measures. Any potential displacement of people resulting from a future project would be evaluated within a supplemental NEPA document. To the extent possible, such actions would be avoided.

4. Property Values and Tax Revenues. Overall, none of the measures included in Alternative 6 are projected to have major, long-term direct impacts on property values or tax revenues in any of the counties throughout the basin. Any long-term effects would be related to community and regional growth, which is not expected to occur. The Illinois River Basin provides billions of dollars in revenue annually from the millions of visitors that hunt, fish, boat, sightsee, or visit the river, and the potential exists for some increase in local sales tax revenue through purchases of goods and services for these activities. The river system also generates thousands of jobs and millions of dollars in taxes for the State and Federal governments.

Increases or decreases in property values could occur because of the potential for land acquisitions associated with the restoration measures. Such actions could affect revenues for the taxing district. Assessment of any potential impacts would be evaluated in a site-specific evaluation.

Presently, not all of the indirect and induced effects of this alternative, as they relate to property values, are known. Changes in the viewshed and any potential resulting impacts on property values and tax revenues for property owners adjacent to the river or restoration area cannot be determined at this time. Any increase in recreational visitors that may result would likely mean more dollars spent in local retail establishments, resulting in an increase in tax revenues for the surrounding community. The extent of impacts from the floodplain restoration measure cannot be determined at this time since it is unknown if, or how much, agricultural land could be taken out of production.

5. Public Facilities and Services. The Illinois River system is a vital component of the national transportation infrastructure and with timely and appropriate improvements, it will continue to serve recreational, commercial, and environmental interests over the long term. The system, as a whole, is a vast resource used by thousands of recreationists every year, and the restoration measures of Alternative 6 could indirectly improve recreation experiences throughout the river corridor. The area

provides vast opportunities for boating, waterfowl hunting, fishing, swimming, wildlife observation, photography, plus activities that are enhanced by proximity to water such as hiking, picnicking, bird watching, camping, and water sports. Public access to these recreational activities throughout the river basin would not be hindered or interrupted by the recommended restoration measures of Alternative 6. Some increases in recreational opportunities could be anticipated if this project were implemented. These increases would be welcome but incidental to achieving the overarching goal of restoring and maintaining ecological integrity, including habitats, communities, and populations of native species, and the processes that sustain them.

For the basin area as a whole, positive impacts to public facilities and services would be expected to result from the enhancement of recreational opportunities associated with improvements included in the preferred alternative. There would be no significant adverse impact on the 9-foot channel navigation project on the Illinois Waterway.

Any potential site-specific impacts to public facilities and services involving the use of public parks, boat ramps, river terminals, water supply, tourism events and attractions, marinas, and recreational areas would be addressed in the site-specific assessments.

The topic of energy conservation at Federal facilities is not applicable to this study.

6. Life, Health, and Safety. Adverse impacts to life, health, or safety generally would not be expected to result from the implementation of the restoration measures recommended in Alternative 6. A hazardous, toxic, and radioactive waste (HTRW) compliance assessment would be conducted prior to the implementation of any measure for a site-specific project and, if deemed necessary, would be addressed in a supplemental document.

7. Business and Industrial Development. Impacts to business and industrial development are generally evaluated in terms of economic impacts to local and regional economy. Direct impacts are those that produce immediate measurable changes, and indirect impacts are those that result in some measurable net change in economic activity over time as a result of the project.

A small increase in business and industrial activity would occur throughout the river basin during construction activities associated with Alternative 6. Development associated with this environmental restoration alternative is not likely to cause displacement of businesses or industries. The most likely long-term impacts to business activity would be related to tourism and recreational activities where increases in visitations and activity by recreationists could serve as a catalyst for the development of small retail businesses that would serve the site users.

All restoration measures included in Alternative 6 requiring some temporary construction activity would result in a short-term increase in business and industrial activity in the areas surrounding the project. A portion of the increase would be attributable to the purchase of materials and supplies, and the remaining increase would result from purchases made by construction workers (e.g., meals, lodging, etc.). These impacts would be evaluated on a site-by-site basis within any supplemental NEPA document. No long-term impacts are anticipated.

8. Employment and Labor Force. For any restoration measures requiring construction, there would be a temporary increase in area employment at the individual site locations. Workers would likely be hired through local labor pools to fill project-related jobs, having little effect on employment

throughout the entire basin. Increased employment at construction sites brings spending to the area, creating increases in local income. Direct construction expenditures result in indirect impacts in the local economy as money spent on construction activity, labor and materials generates additional income and employment in a multiplier fashion

Any long-term impacts to employment and labor force would likely be related to business and industrial growth resulting from indirect positive impacts of potential increases in recreation and tourism in the study area. Overall, changes in regional employment would be minor because of implementing the recommended restoration Alternative 6.

9. Farm Displacement. Achieving the study's overall goal of increasing the Illinois River Basin biological diversity and ecological integrity will likely necessitate the conversion of agricultural land to non-agricultural uses. Restoration measures requiring the acquisition of lands, easements or rights-of-way would be pursued with the consent and participation of willing landowners. Also, efforts would be made to minimize the unnecessary conversion of prime farmland to non-agricultural uses. It is anticipated that if any farmland would be removed from production, the total acres impacted would affect a small portion of the total amount of farmland within the study area. Such impacts would be analyzed on a site-specific basis and would be addressed within any supplemental NEPA documentation.

10. Noise Levels. Overall, no significant long-term impacts to noise levels in the study area would result from the implementation of Alternative 6. Construction activities would be site specific and only those locations would experience a temporary increase in noise levels. Any potential elevation of noise levels resulting from increased recreational activities would also be site-specific; however, most recreational activities would probably take place away from heavily populated or residential areas. All site-specific impacts would be further addressed in supplemental documents.

11. Aesthetics. Aesthetics relates to potential visual impacts resulting from a proposed project. Essentially, the restoration features recommended would be planned and constructed to augment the natural areas and open space, to be aesthetically pleasing, and to enhance the overall viewscape.

The project areas that could be designated for ecosystem measures would mostly be rural in nature with limited development, and would result in fairly minor impacts to the aesthetic resources of the areas. Construction activities would negatively impact the viewscape in most areas during the short-term project construction phase.

The recommended Alternative 6 restoration measures would be expected to created long-term positive aesthetic impacts that would enhance scenic beauty and other natural amenities, provide for public wildlife-oriented recreation and education opportunities, restore and enhance a mosaic of riverine wetlands and riparian habitats, and create a vibrant ecosystem.

No long-term adverse impacts to the aesthetics of the river corridor are anticipated, and it is expected that the proposed restoration measures would not diminish the viewscape of most public areas or local communities.

C. Cumulative Impacts

A cumulative impact is defined as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (from the Council on Environmental Quality, Regulations for Implementing the Procedural Provisions of the NEPA, 40 CFR Parts 1500-1508).
A U.S. Environmental Protection Agency (EPA) report states that cumulative impacts of an action can be viewed as the total effects on a resource, ecosystem, or human community of that action and all other activities affecting the resource no matter what entity (Federal, non-Federal, or private) is taking the actions (USEPA 315-R-99-002).

This report will focus on the cumulative impacts of actions relating to the overarching goal of ecological integrity and the six goals/resource categories for this project: (1) sediment delivery, (2) side channels and backwaters, (3) floodplain, riparian, and aquatic habitats, (4) connectivity (fish passage at dams), (5) water levels, and (6) water and sediment quality.

This project should result in improved environmental conditions for various habitats and increase ecological health in the basin.

Overarching Goal – Restore and Maintain Ecological Integrity, Including Habitats, Communities, and Populations of Native Species, and the Processes that Sustain Them

Ecological integrity within the Illinois River Basin has been degraded by development within its watershed, the river, and its floodplain. The Illinois River Basin ecosystem has been degraded by human activities during the last 150 years and its ecological integrity and ability to recover from disturbances have been diminished. Development of the Illinois River Basin has affected nearly every acre of land in the basin in one way or another. The combined effects of habitat losses, through changes in land use, human exploitation, habitat degradation and fragmentation, water quality degradation, and competition from aggressive invasive species have significantly reduced the abundance and distribution of many native plant and animal species in the Illinois River Basin. In addition, human alterations of Illinois River Basin landscapes have altered the timing, magnitude, duration, and frequency of habitat forming and seasonal disturbance regimes. The cumulative results of these complex, systemic changes are now limiting both the habitats and species composition and abundance in the Illinois River Basin. A cooperative effort among all levels of government and private entities, with an adaptive management strategy, involving implementation of ecosystem restoration projects is needed to improve the condition of the ecosystem.

1. Goal/Resource Category #1 – Reduce Sediment Delivery to the Illinois River from Upland Areas and Tributary Channels with the Aim of Eliminating Excessive Sediment Load.
Historically, land use changes to agriculture and urbanization have increased sediment delivery to the Illinois River Basin. Effective erosion control due to the implementation of conservation practices and programs have reduced the average rate of erosion from croplands relative to earlier rates. There continues to be significant amounts of sediment transported to the Illinois River Basin from areas not addressed by these practices and programs. Without action, excessive erosion will arise from numerous points within the Basin and sediment loading to the Illinois River will continue at unacceptably high levels for the foreseeable future and will continue to degrade vulnerable habitats and impede downstream restoration efforts. Without additional monitoring, it will continue to be very difficult to determine trends in the sediment transport process within the Illinois River and its basin or

to evaluate systemic benefits of improvement projects. If this project is implemented, in 20 years the rates of sediment transport within the Illinois River Basin and the main stem river, especially the transport of silt and clay particles, would be reduced to a level that will better support ecological processes. In order to maintain existing benefits, it will be necessary to ensure that the conservation practices currently installed within the basin remain effective. Recognizing that streams always transport sediment, reduced delivery would be accomplished by implementing projects that reduce bank erosion, allow streams to reach a graded state or control upland sediment as appropriate based on watershed conditions.

2. Goal/Resource Category #2 – Restore Aquatic Habitat Diversity of the Side Channels and Backwaters, including Peoria Lakes, to provide Adequate Volume and Depth for Sustaining Native Fish and Wildlife Communities. Since glacial retreat, sediments eroded from steep tributaries have built large alluvial fans and deltas into the lower Illinois River valley causing the formation of natural constrictions and numerous lakes and backwaters. Historically, the complexes of backwaters and side channels along the main stem Illinois River provided incredibly rich habitat for fish and wildlife. However, the lower Illinois River is low gradient and as a result has been aggrading for years. Sedimentation occurring within this reach has increased significantly, since settlement and now threatens to convert many backwater and side channel areas into mudflats and marshes with decrease habitat value due to hydrologic regimes and turbidity, which essentially exclude vegetation from these areas. In many areas, backwater lakes have been reduced from several feet in average depth in 1900 to inches to a couple feet today.

The WEST Consultants, Inc. (2000) found that according to previous studies, significant sedimentation is occurring and by the year 2050 the Illinois River is predicted to lose a significant portion of its off-main channel backwater areas under current conditions of sediment supply.

In the future without-project, it is expected that there would continue to be further loss of both surface area and volume of backwaters and continued low aquatic habitat quality. This will further limit off-channel habitat for fish and other aquatic species. The consensus of a number of scientists working for the State of Illinois was that due to the shallow condition of existing areas and increasing willow colonization an approximately 1 percent loss rate per year represented the most likely future condition. If this rate were to continue throughout the 50-year project life, the acreage of backwaters would drop to just 32,605 acres a 40 percent loss. It is anticipated in the future without project that the quality of side channel areas will continue to remain at relatively low levels. In many areas there will continue to be further loss of side channel length due island erosion, further loss of depth diversity due to sedimentation, and continued lack of adequate structure (woody debris, rock, etc.). However, with full implementation of Alternative 6, not only would habitat quality increase dramatically, but the loss rate would be cut in approximately half for the roughly 60 backwaters were work is planned. The recommended plan would also result in the restoration for islands and side channels most in need of restoration. With the restoration of 12,000 acres in combination with reduced sediment delivery and side channel restoration, the mix of depth diversity critical to the historical ecology of the system will be maintained throughout the program life. The direct restoration of these acres is anticipated to preserve and maintain additional surrounding acreage from conversion to other uses as well. This will greatly increase backwater area and value over anticipated without project conditions.

3. Goal/Resource Category #3 – Improve Floodplain, Riparian, and Aquatic Habitats and Functions. The healthy functioning floodplain system found in the Illinois River Basin resulted from an unfractured landscape that integrated the ecological outputs of the hydrologic cycle (rainfall, droughts, and floods) through the complex structure of prairies, wetlands, and forests to produce an

abundance of aquatic, insect, wildlife, and plant species. Land use and hydrologic change, and channelization have reduced the quantity, quality, and functions of aquatic, floodplain and riparian habitats, in the Illinois River main stem and its tributaries. Flood storage, flood conveyance, habitat availability, and nutrient exchange are some of the critical aspects of the floodplain environment that have been adversely impacted. Channelization, wetland drainage, and snagging were extremely common throughout the Illinois River Basin for the purpose of draining water from croplands and for flood control. The adverse effects of such activities are extensive, ranging from the direct destruction of stream habitat, to the reduction of structure and microhabitat for fishes, aquatic invertebrates, mussels, and aquatic plants, to the alteration of water conveyance, which increases erosion and sedimentation. The negative effects of channelization and drainage may persist for very long periods and adversely affect habitat many miles away. The habitats and ecological functions within the Illinois River main stem floodplain and the aquatic, floodplains and riparian areas of the basin tributaries are likely to further degrade in the future if conditions remain as is. The desired future condition of the Illinois River main stem floodplain is a reversal of historic loss of functions and increase in habitat area and quality. The desired future condition can be approached by the implementation of Alternative 6. The level of restoration of Alternative 6 would provide the necessary building blocks for sustainable aquatic environments in the perennial and intermittent streams and the main stem of the Illinois Basin, as we work towards the desired future condition.

4. Goal/Resource Category #4 – Restore Aquatic Connectivity (fish passage) on the Illinois River and its Tributaries, where Appropriate, to Restore or Maintain Healthy Populations of Native Species. During the early development periods in the 1800s, dams were constructed to power mills and factories located adjacent to streams; this is another reason that development occurred along waterways. On large rivers such as the Illinois, dams were constructed to aid navigation during the 1840s to 1860s, and rebuilt in a large fashion by the Corps, in the 1930s. Later, dams were constructed along major tributaries for water supply, flood control, and recreation.

There is a lack of aquatic hydrologic connectivity on the Illinois River and its tributaries. Aquatic organisms do not have sufficient access to diverse habitat such as backwater and tributary habitat that are necessary at different life stages. There are seven dams on the main stem Illinois River/Illinois Waterway at La Grange, Peoria, Starved Rock, Marseilles, Dresden Island, Brandon Road, Lockport, and T. J. O'Brien. The number and impact of dams on the major tributaries varies.

Additional dams may be constructed in the future. The need for potable water for increasing populations in northeast Illinois may result in construction of dams or modification of existing dams for water supply purposes. It is anticipated that new dams may be constructed to accommodate fish passage; however, any new dams would likely have some impact on connectivity. It is likely that some existing dams will be removed in the future. Dam removal will be municipality driven and will be related to costs of continued operations and maintenance. The success or failure of invasive species barriers will affect connectivity in the future.

The desired future condition is a river system that provides connected habitats for native aquatic species allowing them to utilize critical habitats at critical time periods and re-colonize areas after extreme events or disturbance.

The desired future condition is restoring significant connectivity between the main stem and the appropriate major tributaries. The main stem Illinois River would be connected to the majority of its tributaries including the Sangamon River, Spoon River, Fox River, Kankakee River, and DuPage

River. Restored connectivity between the main stem and the Des Plaines River is desirable, but this will need to be balanced with the desire to limit dispersal of invasive species.

The desired future condition is to restore within-tributary connectivity in the major tributary basins. The desired future condition is passage of 100 percent of large-river fish on the Illinois River main stem up to river mile (RM) 286 at Brandon Road Lock and Dam. This would require improved passage at Starved Rock, Marseilles and Dresden Lock and Dams. The Lockport, Brandon, and T.J. O'Brien Locks and Dams would continue to block fish movement, thus limiting dispersal of invasive aquatic species between the Upper Mississippi River System and the Great Lakes.

5. Goal/Resource Category #5 – Naturalize Illinois River and Tributary Hydrologic Regimes and Conditions To Restore Aquatic and Riparian Habitat. Hydrology is a primary driving force for aquatic ecosystem processes. The magnitudes, timing and duration of flows and water levels often regulate the nature of chemical and biological functions in these systems. Because of this, unfavorable hydrologic regimes can prevent desirable levels of ecosystem function; by changing such regimes so that a more desirable range of hydrologic conditions are provided, benefits to a wide range of ecosystem functions can be expected. Historical observations and measurements of flows from undisturbed areas indicate that storm flow rates from Illinois River watersheds prior to European settlement were probably much lower than current rates. Higher tributary flows can be attributed to land use changes, tile drainage, and increased hydraulic efficiency brought about by channelization. The construction of navigation dams and diversion of flows from Lake Michigan have generally increased the river water surface elevation and have altered the nature of the flooding regime along certain reaches of the river. The magnitude and frequency of water level fluctuations have notably increased in portions of the river since daily water level monitoring began in the 1880's. Reducing the amount of water level fluctuation would likely provide multiple benefits to native biological communities. Several unknown factors, notably potential changes in land cover, land use and climate, play major roles in the future hydrologic regimes throughout the Illinois River Basin.

The future with-project condition minimizes the water level conditions that degrade ecological function in the Illinois River Basin. This does not necessarily require a return to any particular prior state, but rather creating conditions that allow ecosystem functions to sustain themselves at an acceptable level given the constraints of multiple uses throughout the basin. In regard to tributary flows, the current state of knowledge suggests that flow regimes with reduced peaks and increased baseflows will provide more desirable levels of ecosystem function than currently occurs. Along the main stem Illinois River, the future with-project conditions include a reduction in the incidence and speed of water level changes; gradual water level rises and falls would benefit a number of biological functions.

6. Goal/Resource Category #6 – Improve Water and Sediment Quality in the Illinois River and Its Watershed. Natural processes, geomorphology and human activities influence water quality. A number of factors including domestic sewage, industrial wastes, and agricultural land use practices have adversely affected water quality in the Illinois River Basin during the past 100 years. In the past 30 years, improvements in water quality have taken place with implementation of the Clean Water Act. However, runoff from industrialized and urbanized areas, and from agricultural fields in the basin, continue to transport sediment, fertilizers, and pesticides into the waters of the watershed. Waves generated by wind and commercial tows re-suspend fine sediments in the main stem, resulting in ongoing poor water clarity. Sedimentation is perhaps the most serious problem threatening the Illinois River Basin today. The Illinois River Basin has not yet fully recovered to an ecologically sustainable condition. State, Federal, and local natural resource agencies must continue to promote

efforts aimed at restoring water quality throughout the Illinois River Basin. This would require basin-wide cooperation with many partners, habitat restoration projects, ecological monitoring and data gathering, and changes in land use practices. Attainment of water quality improvements would not only promote the survival of aquatic organisms, but would also protect public health.

Summary. The estimated projections of the environmental/ecosystem benefits from each Goal/Resource category are based on the assumption that not only will this program be implemented, but that it will be implemented to the full funding amount represented in Alternative 6. Section 3 of this report describes areas of risk and uncertainty associated with this program. One of those areas of uncertainty is funding, at the Federal and/or State level. If that uncertainty becomes a reality at some point in the future, at either level, the assumption made in arriving at the estimated predictions of future ecosystem benefits and trends will have been overstated. Lowered funding levels, and consequential levels of effort compared to what is required to achieve full benefit from implementation of Alternative 6 would result in lower ecosystem benefits than those predicted in the cumulative impact sections above.

Future monitoring results and consequential adaptive management measures could result in new, different cumulative impacts for the future.

D. Environmental Impacts of the Non-Preferred Alternatives

Figure 5-1 depicts the estimated trends, through time, in ecological integrity relative to the eight alternatives evaluated for this program. Alternative 6 is the recommended alternative and Alternative 7 reflects the level of effort/commitment required to achieve the desired future condition for this program.

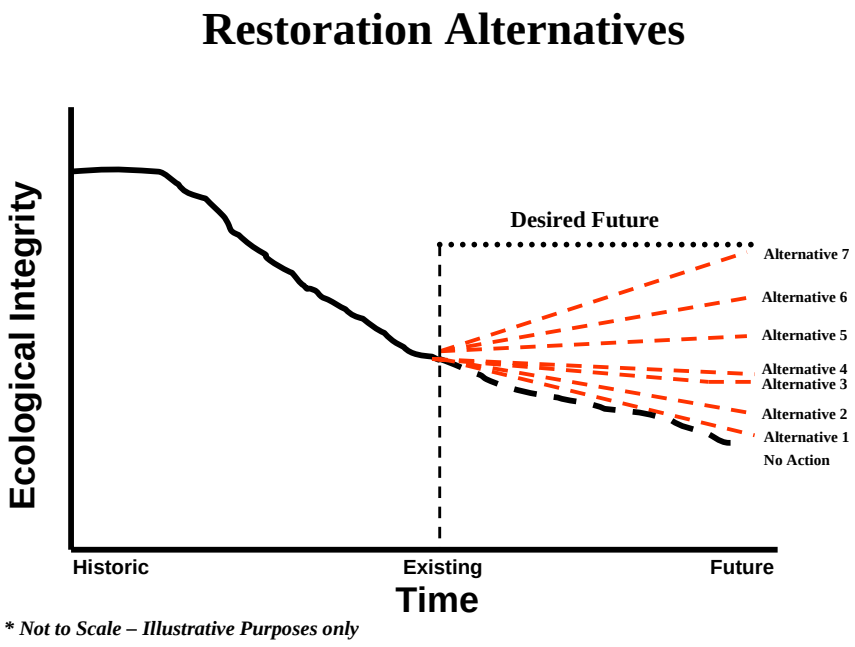

Figure 5-1. Conceptual Restoration Benefits of Alternatives

1. No Action. This alternative represents a continuation of environmental management activities and rehabilitation efforts at current levels. Under this alternative ecosystem integrity/environmental degradation would continue and the habitat loss projected in the Cumulative Effects Study (WEST Consultants, Inc 2000) and the Habitat Needs Assessment (Theiling et al. 2000) would be realized. While the ongoing efforts to protect, maintain, and restore habitat and ecosystem health would be beneficial, the current level of effort would not be sufficient to counteract the cumulative impacts affecting river resources. This alternative does not promote a sustainable system.

Table 5-3 illustrates what level of effort for each goal would be undertaken for each of the eight alternatives.

The numbered alternatives generally represent incrementally higher levels of effort per goal. This is not a strict rule, but a generality. That is, the higher the alternative number, the more the level of effort would be implemented, (e.g., more backwater acres restored, more side channels restored, more acre-feet of stormwater storage constructed, etc) in future restoration projects.

2. Alternatives 1 through 4, if implemented, represent improvements compared to the No Action Alternative, but still show the ecological integrity trend line declining into the future. The difference between Alternatives can be summarized by the differing rates of slowing the decline, (the higher the Alternative number, the slower the rate of decline).

3. Alternative 5 is the first alternative evaluated, where the level of restoration effort would result in stable or improving system ecological integrity.

4. Alternative 7 represents the desired future condition mentioned throughout this report. The desired future was based on the expert opinion of resource managers as to what the system should look like in the future to restore and maintain ecological integrity, including habitats, communities, and populations of native species, and the processes that sustain them. This level of effort was developed to provide an upper limit of potential restoration considering current political, social, and fiscal constraint. The implementation of Alternative 7 would result in greater positive natural resource impacts to the river basin than the preferred Alternative 6. Alternative 7 is the second alternative where significant increases in sustainability of ecological processes and functions could be expected.

Table 5-3. System Plan – Benefits Summary

	Overarching Goal	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6
Alternative	**Ecological Integrity**	**Sediment Delivery**	**Backwaters and Side Channels**	**Floodplain, Riparian, and Aquatic**	**Connectivity**	**Water Level Management**	**Water Quality**
No Action	decline	some increase delivery	decline 1%/ yr	No Change	potential improvement	more fluctuations	minor improvement
1	regional improvements	0% upper Tribs 20% Peoria Tribs 0% lower Tribs	3,600 BW acres 10 side channel 10 island protect	5,000 acres MS 5,000 acres Trib 25 stream miles		-1.5% TPF 0% TBF 0% MSF	minor regional improvements
2	maintain current habitat at system level	0% upper Tribs 40% Peoria Tribs 0.5% lower Tribs	6,100 BW acres 20 side channel 15 island protect	5,000 acres MS 10,000 acres Trib 50 stream miles		-2.3% TPF +5% TBF 0% MSF	regional improvement
3	begin system improvements - sediment focus	11% upper Tribs 40% Peoria Tribs 4% lower Tribs	8,600 BW acres 30 side channel 15 island protect	20,000 acres MS 20,000 acres Trib 100 stream miles	Fox, DuPage, Des Plaines	-2.3% TPF +5% TBF 66% MSF	some system improvement
4	begin system improvements - tributary focus	11% upper Tribs 40% Peoria Tribs 4% lower Tribs	6,100 BW acres 20 side channel 15 island protect	5,000 acres MS 20,000 acres Trib 100 stream miles	Fox, DuPage, Des Plaines, Kankakee, Spoon, Aux Sable	-8% TPF +20% TBF 66% MSF	some system improvement
5	ecosystem integrity stable	11% upper Tribs 40% Peoria Tribs 4% lower Tribs	8,600 BW acres 30 side channel 15 island protect	40,000 acres MS 40,000 acres Trib 250 stream miles	Fox, DuPage, Des Plaines, Kankakee, Spoon, Aux Sable	-8% TPF +20% TBF -66% MSF	some system improvement
6	measurable increase at system level	11% upper Tribs 40% Peoria Tribs 20% lower Tribs	12,000 BW acres 35 side channel 15 island protect	75,000 acres MS 75,000 acres Trib 500 stream miles	Fox, DuPage, Des Plaines, Kankakee, Spoon, Aux Sable	-11% TPF +20% TBF -66% MSF	some system improvement
7	reasonable upper bound to system improvements	11% upper Tribs 40% Peoria Tribs 20% lower Tribs	18,000 BW acres 40 side channel 15 island protect	150,000 acres MS 150,000 acres Trib 1000 stream miles	Fox, DuPage, Des Plaines, Kankakee, Spoon, Aux Sable, 3 Main Stem Dams	-23% TPF +50% TBF -73% MSF	some system improvement

Overarching Goal – Ecological Integrity will be addressed by the other goals through prioritization and specifications on restoration measures.
Goal 1 - Sediment delivery benefits are expressed in percentage reductions in tributary delivery resulting from in-channel stabilization and upland practices.
Goal 2 - Backwater (BW) Benefits are expressed in acres dredged, but will benefit larger reaches. Side Channel benefits associated with increased structure and some dredging.
Goal 3 - Main stem (MS) floodplain and riparian (trib) areas are expressed as acreages. Aquatic areas are expressed in stream miles.
Goal 4 - Connectivity (Fish Passage) lists reaches to be addressed. Main stem passage is at Starved Rock, Marseilles, and Dresden Island.
Goal 5 - TPF and TBF are tributary peak flow and base flow, respectively. MSF is the change in the main stem fluctuation regime, representing an average of 5-day windows in the lower river fluctuations over the course of the average growing season. Auto gates allow increased management to smooth flow releases and are included in Alternatives 6 and 7. Wicket dam replacements are considered for the Peoria and La Grange pools in Alternative 7.
Goal 6 - Water quality issues will be addressed through other goals. Greatest benefits likely associated with Goals 1 and 3.
Only rough benefits estimations are included in table; see writeup for additional details.

E. Probable Adverse Environmental Impacts Which Cannot Be Avoided

When future site-specific ecosystem restoration projects are proposed, planned and ultimately implemented, some of them will have the potential to convert agricultural land to non-agricultural uses. This conversion is regrettable, but probably necessary if the overarching goals of increasing Illinois River Basin biological diversity and overall ecological integrity are to be achieved. Six goals are described in Section 3 of this report. Some specific management measures under certain goals could be implemented and could result in the conversion of agricultural land.

Important, sensitive resources, which may be adversely affected by construction include, but are not limited to fisheries, mussel assemblages, Federal and State endangered and threatened species, bottomland forests, wetlands, rookeries, fish spawning areas, and recreational use areas. Despite this potential adverse impact from construction activities, the overall impact to ecological components, both biotic and abiotic would improve through time.

Following a determination of adverse effect, the Corps will attempt to avoid the archeological, architectural, underwater or other historic object or property.

Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA) and its implementing regulations 36 CFR Part 800: "Protection of Historic Properties," establishes the primary policy, authority for preservation activities, and compliance procedures. The NHPA ensures early consideration of historic properties preservation in Federal undertakings and the integration of these values in to each agency's mission. The Act declares Federal policy to protect historic sites and values in cooperation with other nations, states, and local governments. The Corps shall, prior to the approval of the expenditure of any Federal funds on the undertaking, take into account the effect of the undertaking of any district, site building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places. The Corps shall afford the Advisory Council on Historic Preservation a reasonable opportunity to comment with regard to such undertaking. In the event that adverse impacts to historic properties occur as a result of implementing the site-specific ecosystem restoration projects that are proposed, planned and ultimately implemented avoidance measure will be discussed and the benefits of the project will be studies relative to the significance of the historic properties, as set forth by Section II of the executed PA (appendix A).

Efforts will be made to minimize the unnecessary and irreversible conversion of prime farmland to non-agricultural uses. Also, efforts will be made to: (1) identify and take into account the adverse effects on the preservation of prime farmland; (2) consider alternative actions, as appropriate, that could lessen adverse effects to prime farmland; and (3) to ensure to the extent practicable, the project is compatible with State and units of local government and private programs to protect prime farmland.

Future site-specific planning documents (EAs) will provide specific amounts of agricultural land, both prime and non-prime, proposed for conversion based on those projects specific goals, system goals, and resultant management measures designed to fulfill those goals.

The only other significant resource that may be adversely impacted is bottomland hardwoods (BLH). It is possible, but not necessarily probable, that some BLH could be adversely impacted if certain management measures were to be implemented. For example, when implementing backwater dredging to deepen and/or enlarge a historic backwater to restore/provide habitat for migratory waterfowl and/or fish, some amount of BLH may need to be removed. Any effort to estimate how much BLH could eventually be adversely impacted—without any precise location of where or which

management/restoration measure would be implemented—would carry with it a high degree of uncertainty. When individual projects are developed, more precise estimates of adverse impacts to any significant resource would be analyzed and declared.

The management measures and potential impacts, by goal, are as follows:

Goal 1: Reduce Sediment Delivery

Management Measures

Stream Stabilization. Although most stream stabilization work would consist of work within the channel to establish geomorphically stable conditions, in some cases existing streambanks may be overly steep and require regrading for stability. These instances may require removal of farmland commensurate with the width necessary to grade streambanks to a stable slope.

Upland Sediment Facilities. In specific locations, downstream sediment delivery may be significantly reduced by installation of upland sediment control facilities, such as water and sediment control basins (WASCOBs) or other sediment traps. Areas in agricultural production could be impacted through outright removal from production or acquisition of temporary or seasonal flowage, and flooding easements.

Filter Strips. These practices would be implemented in areas adjacent to tributary streams to filter sheet flow runoff, stabilize streambanks and reduce sediment delivery to receiving waters. This practice would require removal of farmland commensurate with the strip width necessary to achieve reduction goals.

Goal 2: Restore Aquatic Habitat Diversity of Side Channels and Back Waters

Management Measure

Dredging of Backwaters and Side Channels – In association with dredging to restore depth diversity in backwaters and side channels, areas would need to be identified for the placement of dredged materials. To the extent possible the materials would be used to create additional program benefits: restoration of island habitat, increasing topographic diversity on existing islands, and beneficially as cover for brownfield and strip mine sites. Additionally, locations may be identified where dredged material could be stockpiled for beneficial use for any number of purposes if demand can be identified. It is anticipated that there may be locations were the only available placement option would be on current agricultural lands of willing landowners. While the potential exists to use fine sediments as a soil additive to improve yields of sandy soils, placement on current agricultural land could result in some conversion.

Goal 3: Improve Floodplain, Riparian, and Aquatic Habitats

Management Measures

Riparian Buffer. These practices would be implemented in areas adjacent to tributary streams to filter sheet flow runoff, stabilize streambanks, improve habitat function, and reduce sediment delivery to receiving waters. This practice will require removal of farmland

commensurate with the strip width necessary to achieve sediment reduction and ecosystem goals.

Wetland Plantings. Wetland plantings as a stand-alone measure will not normally require conversion of farmland. However, two instances associated with their use may result in farmland conversion impact. The first would be when a larger wetland complex is being constructed within a floodplain area that is currently in production. In the second instance, farmed wetlands could be planted with wetland species.

Prairie Plantings. Restoration of areas of native prairie within the Basin and tributary floodplain is considered to be of major importance to restoration of the ecological integrity of the system. Areas of idled pastureland, active pastureland, and cropland could potentially be impacted by this restoration measure.

Managed Moist Soil Units. Impacts to farmland because of this management measure would potentially include removal of adjacent farmland from production or acquisition of temporary or seasonal flowage and flooding easements.

Wetland Restoration. Restoration of wetland areas with associated native plant species within the Basin is considered to be of major importance to restoration of the ecological integrity of the system. Areas in agricultural production could be impacted through outright removal from production or acquisition of temporary or seasonal flowage, and flooding easements.

Tile Drainage Water Management. This practice could impact farmland by regulating outflows from existing tile-drained areas. While the potential exists for adverse impacts to accessibility and crop yields, the professional literature suggests that these impacts can be mitigated through sound management guidelines.

Tile Removal. This practice may impact farmland by diminishing average yields over time.

Goal 5: Naturalize Illinois River and Tributary Hydrologic Regimes and Conditions To Restore Aquatic and Riparian Habitat

Management Measures

Tributary Stormwater Storage Areas. Providing stormwater storage volume in tributary areas would reduce the adverse geomorphic and ecological effects of high flows in basin rivers and streams, with potential benefits from reduced fluctuations in the main stem Illinois River. These are likely to be a combination of ponds and expanded floodplain benches. Areas in agricultural production could be impacted through outright removal from production or acquisition of temporary or seasonal flowage, and flooding easements.

Tributary Stormwater Infiltration Areas. Increasing infiltration throughout the Illinois River Basin would reduce the adverse geomorphic and ecological effects of high flows in basin rivers and streams, with potential benefits from reduced fluctuations in the main stem Illinois River, and would provide increased low flows between storm events. In some instances infiltration might be increased without changing existing land uses, but in other cases areas may have to be dedicated as infiltration areas or filter strips. Areas in agricultural production could

be impacted through outright removal from production or acquisition of temporary or seasonal flowage, and flooding easements.

It is anticipated that no other significant environmental resource would suffer probable adverse impacts from implementation of the systemic project.

F. Any Irreversible or Irretrievable Commitments of Resources if the Selected Alternative Is Implemented

While not directly tied to the recommended plan, Congress study and construction of Critical Restoration Projects in Section 519 of WRDA 2000. Since funding of this section in Federal Fiscal Year 2001, funds have been expended on the study of eight site-specific project locations. Plans and Specifications for the first four of these sites are being prepared with the potential for construction of these projects. All future NEPA requirements for restoration projects, under this program, will be addressed through stand-alone Environmental Assessments and their Findings of No Significant Impacts. If implemented prior to the completion and final approval of this report, it would represent a commitment of Federal resources to the restoration of the Illinois River Basin. For a listing and summary of the authorized critical restoration projects, see Section 6.

No irreversible or irretrievable commitment has occurred which would have the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative. No commitment of resources has occurred that would prejudice the selection of any alternative before making a final decision on this program.

G. Relationship of the Selected Alternative to Land Use Plans

Given the magnitude of this program, both in the large array of management measures that could be employed in any given project, but also the geographic size of the Illinois River Basin (approximately 30,000 square miles), determining the precise relationship between any future ecosystem restoration project within the basin and any existing land use planning document is not possible. It is likely that future alterations in land use or habitat type may result from implementation of management measures at ecosystem restoration project sites. These alterations may be in conflict with existing land use, whether they exist in a planning document or not. For example, if some future restoration project dredged out a side channel, placing the dredged material on a nearby agriculture field would represent a change in the previous land use for the placement site. Future site-specific planning documents will accurately assess impacts of proposed ecosystem restoration measures to land use.

H. Compliance with Environmental Quality Statutes

National Environmental Policy Act of 1969, as amended. The compilation of this EA, describing systemic ecosystem restoration as a result of future separate restoration projects throughout the entire basin, fulfills the NEPA obligation for the program. All separate, site-specific future restoration projects under this Comprehensive Plan's authority, would compile individual NEPA documents fully disclosing project alternatives and the environmental impacts of that proposed

project. Future site-specific NEPA documents would address compliance with all appropriate environmental quality statutes including, but not limited to, those listed below.

National Historic Preservation Act of 1966, as amended. The Illinois River Basin Restoration is in compliance with the National Historic Preservation Act of 1966, amended through 2000 (NHPA, Public Law 89-665; 16 U.S.C. 470 et seq.). The NHPA and its implementing regulations 36 CFR Part 800: "Protection of Historic Properties," establishes the primary policy, authority for preservation activities, and compliance procedures. The NHPA ensures early consideration of historic properties preservation in Federal undertakings and the integration of these values in to each agency's mission. The Act declares Federal policy to protect historic sites and values in cooperation with other nations, states, and local governments. The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally-assisted undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking, take into account the effect of the undertaking of any district, site building, structure, or object that is included in or eligible for inclusion in the NRHP. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation a reasonable opportunity to comment with regard to such undertaking.

The construction of the Site Specific Projects and associated maintenance, operation, and monitoring shall address historic property and cultural resource compliance promulgated by the NHPA and concerns in NEPA documents and related correspondence. Adverse effects would be mitigated under the appropriate stipulations of the PA.

As evidence of compliance, this documentation will be coordinated with those on the final Consulting Parties List (appendix A) and be placed into the permanent files of the signatories of the PA.

Pursuant to Section 800.3 of the ACHP's regulations and to meet the responsibilities under the NEPA, the Corps and the Illinois DNR developed a preliminary consulting parties list and invited participation in the development and review of a draft PA by letter dated July 12, 2004. Those on the preliminary consulting parties list, comprised of 325 parties, including 47 federally-recognized Tribes, were provided an opportunity to comment on a draft of the PA by letter dated October 5, 2001 (appendix A). Since the Corps remains unaware of any lands held in Federal trust or of any Federal trust responsibilities for Native American Indians within the Illinois River Basin, the Corps requested any information concerning our Federal trust responsibilities by the October 5, 2001, letter.

The Corps is concerned about impacts to those traditional cultural properties and sacred sites recognized by Native Americans, tribes, ethnic and religious organizations, communities, and other groups as potentially affected by the Illinois River Basin Restoration. Presently, the Corps is unaware of any traditional cultural properties or sacred sites within the Illinois River Basin. The Corps is unaware of any Native American lands or tribal lands held in trust within the Illinois River Basin. No Federal trust responsibilities are known in the Illinois River Basin. If there are concerns or potential effects known or identified, those on the preliminary consulting parties lists were requested to complete a "Traditional Cultural Property and Sacred Site Form" by the October 5, 2001 letter (appendix A). To facilitate Tribal coordination, the Corps asked those on the preliminary consulting parties list to refer to the National Park Service, NRHP Bulletin 38, *Guidelines for Evaluating and Documenting Traditional Cultural Properties*, available for internet viewing at http://www.cr.nps.gov/nr/publications/bulletins.htm.

Locations of traditional cultural properties or sacred sites, consisting of architecture, landscapes, objects, or surface or buried archaeological sites, identified in this coordination effort, can be considered to be sensitive information, pursuant to Section 304 of the NHPA. Upon request from any

consulting parties not to disclose locations, the Corps and the Illinois DNR will secure this information from the public.

Various versions of the draft PA, the executed PA by the signatories, final consulting parties' lists and supporting correspondence is found in Corps letters dated October 16, 2002, December 4, 2002, and February 7, 2003 (appendix A). Those on the list were asked to comment on earlier drafts of this PA and submit a request to be placed on the final consulting parties list. The Corps received comments on the Illinois River Basin Restoration, the draft PA, a completed Traditional Cultural Property and Sacred Site Form, and requests for inclusion in the final consulting parties list (appendix A). The Corps received comments on the Illinois River Basin Restoration, the draft PA, a completed Traditional Cultural Property and Sacred Site Form, and requests for inclusion in the final consulting parties list and attached to the October 16, 2002 letter (appendix A).

Due to the necessity in executing rights-of-entry, curatorial agreements, real estate actions, and etc., for implementing the Illinois River Basin Restoration, the Chicago, Rock Island, and St. Louis Districts of the U.S. Army Corps of Engineers, the Illinois DNR, the SHPO, and the ACHP executed a PA entitled: *Programmatic Agreement Among the Chicago, Rock Island, and St. Louis Districts of the U.S. Army Corps of Engineers, the State of Illinois Department of Natural Resources, the Illinois State Historic Preservation Officer, and the Advisory Council on Historic Preservation, Regarding Implementation of the Illinois River Ecosystem Restoration*. The executed PA by the signatories forms a partnership for the purposes of implementing the Illinois River Basin Restoration, authorized by Section 216 of the 1970 Flood Control Act and Section 519 (Illinois River Basin Restoration) of the WRDA of 2000 and is found in the February 7, 2003 Corps correspondence (appendix A).

Those on the final consulting parties list (appendix A, letter dated October 16, 2002, Enclosure 3) will be provided with study newsletters, public meeting announcements, special releases, and notifications of the availability of report(s), including all draft agreement documentation, as stipulated by 36 CFR Part 800.14(b)(ii) of the NHPA. Consulting parties may request correspondence on future topics relevant to compliance concerning the Illinois River Basin Restoration and to provide comments. Comments on the Illinois River Basin Restoration program or projects received by the Corps and the Illinois DNR will be taken into account when finalizing plans for the Illinois River Basin Restoration, as promulgated by the NHPA.

The PA allows for determining effects to significant historic properties from both site specific and systemic impacts from the proposed alternatives. Supporting investigations will be conducted in a phased-approach consisting of Phase I survey, Phase II testing, and Phase III treatment. Phase III treatment of a historic property may include preservation, avoidance, or mitigation of the loss of the property through some form of data recovery such as, but not limited to complete excavation of an archeological site or the detailed documentation of a standing structure. This information would be documented in each of the site-specific project NHPA documents.

Where measures and alternatives under consideration for the Illinois River Basin Restoration site-specific projects that consist of corridors or large land areas, or where access to properties is restricted, the Corps may use a phased process to conduct identification and evaluation efforts. The PA was executed pursuant to Sec. 800.14(b) and to comply with the NEPA pursuant to Sec. 800.8 relative to issues of real estate and curation. Also, the programmatic process shall establish the likely presence of historic properties within the area of potential effects for each alternative or inaccessible area through background research, consultation and an appropriate level of field investigation, taking into account the number of alternatives under consideration, the magnitude of the undertaking and its likely effects, and the views of the SHPO/THPO and any other consulting parties. As specific aspects or locations of

an alternative are refined or access is gained, the Corps shall proceed with the identification and evaluation of historic properties in accordance with paragraphs (b)(1) and (c) of section 800.4 of the NHPA and the PA.

The Corps and the Illinois DNR executed the PA, promulgated under 36 CFR Part 800.14(b)(ii) of the NHPA to afford protection to known and unknown historic properties accorded by the NHPA (appendix A). As regulated by in 36 CFR Part 800.8(c)(1), the executed PA will be used within reports promulgated under the NEPA. It is the opinion of the Corps and the DNR that the PA is appropriate for the Illinois River Basin Restoration compliance promulgated under NHPA and the protection of any unreported or recorded historic properties.

Pursuant to Subpart C-Program Alternatives, Section 800.14(b) of the NHPA, the PA was negotiated and executed to govern the implementation of the Illinois River Basin Restoration relative to the complex project situations or multiple undertakings. Compliance with the NHPA will be address in each of the site-specific NEPA documents, where the restoration measures and locations can be specifically defined to delineate the area of potential effect. Those on the Final Consulting Parties List (appendix A) will be notified of the proposed restoration project, coordination, and consulting effort by distribution and reporting.

Compliance with the NHPA will be available for consulting parties for public review and comment by distribution of appropriate correspondence, phased historic property reports, and NEPA reports, and ancillary and supporting documentation. All consulting parties must be aware that the specific locations of historic and archaeological properties are subject to protection through nondisclosure under Section 304 of the National Historic Preservation Act. No maps subject to public review/access shall contain any information on archeological sites. This information is not to be released in order to protect the resources at the sites. Any requests for site (significant historic properties) location information should contain formal comment, referencing the correct log number or Corps contract number, from the Illinois Historic Preservation Agency, Springfield, Illinois.

Although the Corps PA assures NHPA compliance, consultation concerning all historic property findings, and that any determination of effects have been identified and documented within the area of potential affect and the Corps has taken into account all historic properties relative to the planning process through consultation and coordination. If any previously undiscovered historic properties are identified or encountered during the undertaking, the Corps will discontinue construction activities and resume coordination with the appropriate SHPOs, THPOs, Tribes, other consulting parties to identify the significance of the historic property and determine potential effects as executed by the PA.

Archaeological and Historic Preservation Act of 1974 (16 U.S.C. § 469). It is the purpose of sections 469 to 469c-1 of this title to further the policy set forth in sections 461 to 467 of this title, by specifically providing for the preservation of historical and archeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of (1) flooding, the building of access roads, the erection of workmen's communities, the relocation of railroads and highways, and other alterations of the terrain caused by the construction of a dam by any agency of the United States, or by any private person or corporation holding a license issued by any such agency or (2)any alteration of the terrain caused as a result of any Federal construction project or federally-licensed activity or program.

Protection and Enhancement of the Cultural Environment [Executive Order (EO) 11593]. The Federal Government shall provide leadership in preserving, restoring and maintaining the historic and cultural environment of the Nation. Agencies of the executive branch of the Government

(hereinafter referred to as 'Federal agencies') shall (1) administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations, (2) initiate measures necessary to direct their policies, plans and programs in such a way that federally-owned sites, structures, and objects of historical, architectural or archaeological significance are preserved, restored and maintained for the inspiration and benefit of the people, and (3), in consultation with the Advisory Council on Historic Preservation 16 U.S.C. 470(i), institute procedures to assure that Federal plans and programs contribute to the preservation and enhancement of non-federally-owned sites, structures and objects of historical, architectural or archaeological significance.

Preserve American (EO 13287). This EO states policy for the Federal Government to provide leadership in preserving America's heritage by actively advancing the protection, enhancement, and contemporary use of the historic properties owned by the Federal Government, and by promoting intergovernmental cooperation and partnerships for the preservation and use of historic properties. The contemporary historic properties within the Illinois River Basin, consist primarily of the Illinois Waterway lock and dam facilities. The historic resources of the Illinois Waterway Navigation Facilities consist if seven multiple property historic districts, and was signed by the Illinois State Historic Preservation Officer on December 10, 2002. The NRHP form delineates the 7 district boundaries, categorizes the 35 contributing and 18 noncontributing resources, and evaluates each District's contribution to patterns of transportation, maritime history, engineering, commerce, conservation, military, politics, economics, labor, and social history from 1905 to 1952.

To fulfill the requirements of the certification procedure, the Corps' Rock Island and St. Louis Districts forwarded both NRHP nomination forms for the Illinois Waterway Navigation Facilities to the Corps Headquarters in Washington, DC, which were certificated by the Deputy Historic Preservation Officer (DHPO). The NRHP nomination forms were formally submitted to the National Park Service Keeper of the National Register of Historic Places in January 2004 for evaluation and potential certification for listing. This evaluation is ongoing. If the UMR and IWW are listed on the NRHP, they will achieve much-deserved international attention. The Corps' contribution to the Nation's engineering history will be ensured for our significant waterways.

It is not expected that any ecosystem measures will affect the National Register of Historic Places eligibility of the Illinois Waterway Navigation Facilities. If any site-specific ecosystem projects are located near ant of the seven multiple property historic districts the Corps will comply with the goals and intent of EO 13287

Archaeological Resources Protection Act, as amended (16 U.S.C. 470aa et seq.). This Act requires a permit for excavation or removal of archaeological resources from publicly held or Native American lands. Excavations must further archaeological knowledge in the public interest, and the resources removed are to remain the property of the United States. If a resource is found on land owned by a Native American tribe, the tribe must give its consent before a permit is issued, and the permit must contain terms or conditions requested by the tribe. Requirements of the Archaeological Resources Protection Act would apply to any project excavation activities that resulted in identification of archaeological resources.

Locating Federal Facilities in Historic Properties in our Nation's Central Cities (EO 13006). Artifacts, reports, samples, and any ancillary data generated by the excavation or removal of archaeological resources from publicly held lands in Illinois and one copy of all final reports will be curated at Illinois State Museum Society, Springfield, Illinois.

Abandoned Shipwreck Act of 1987 (43 U.S.C. 2101-2106). The Abandoned Shipwreck Act asserts the ownership of the United States over any abandoned shipwreck in State waters and submerged lands. The act provides federal protection to any shipwreck that meets the criteria for eligibility for inclusion in the National Register for Historic Places, therefore dredging, dredged disposal, or other ancillary disturbances on or near vicinity of such wrecks may require determinations of effect, archaeological surveys and investigations and coordination with consulting parties. The Corps conducted an archival search for historic properties following the "Policy and Procedures for the Conduct of Underwater Historic Resource Surveys for Maintenance Dredging and Disposal Activities" (DGL-89-01, 1989) to assist in avoidance of significant impacts to these types of resources. The Corps has also contracted the report *An Investigation of Submerged Historic Properties in the Upper Mississippi River and Illinois Waterway* (Custer and Custer 1997). Final copies are located in the permanent files of the Illinois Historic Preservation Agency and the Corps.

American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996). The American Indian Religious Freedom Act reaffirms Native American religious freedom under the First Amendment and establishes policy to protect and preserve the inherent and constitutional right of Native Americans to believe, express, and exercise their traditional religions. This law ensures the protection of sacred locations and access of Native Americans to those sacred locations and traditional resources that are integral to the practice of their religions. Further, it establishes requirements that would apply to Native American sacred locations, traditional resources, or traditional religious practices potentially affected by the construction and operation of the proposed project. In compliance with this Act, the Corps letter dated October 5, 2001 (appendix A) was send via Distribution lists that contained a Consulting Parties List, comprised of 325 parties, including 47 federally-recognized Tribes. This correspondence also contained a "Traditional Cultural Property and Sacred Site Form," to facilitate tribal coordination, the Corps requested the consulting parties List to refer to the National Park Service, NRHP Bulletin 38, *Guidelines for Evaluating and Documenting Traditional Cultural Properties*, available for Internet viewing at (http://www.cr.nps.gov/nr/publications/bulletins.htm).

Locations of traditional cultural properties or sacred sites, consisting of architecture, landscapes, objects, or surface or buried archaeological sites, identified in this coordination effort, can be considered to be sensitive information, pursuant to Section 304 of the NHPA. Upon request from any consulting parties not to disclose locations, the Corps and the Illinois DNR will secure this information from the general public.

Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 et seq). The Native American Graves Protection and Repatriation Act provides for the protection of Native American cultural items, and establishes a process for the authorized removal of human remains, funerary objects, sacred objects, and objects of cultural patrimony from sites located on lands owned or controlled by the federal government. Major actions to be taken under this law include (1) the establishment of a review committee with monitoring and policymaking responsibilities, (2) the development of regulations for repatriation, including procedures for identifying lineal descent or cultural affiliation needed for claims, (3) the oversight of museum programs designed to meet the inventory requirements and deadlines of this law, and (4) the development of procedures to handle unexpected discoveries of graves or grave goods during activities on federal or tribal land. The provisions of the Act would be invoked if any excavations led to unexpected discoveries of Native American graves or grave artifacts. The Corps, the THPOs and the SHPOs have entered an agreement to address the potential applicability of the Native American Graves Protection and Repatriation Act to artifacts collected during site characterization activities.

If human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered or collected, the Corps will comply with all provisions outlined in the appropriate state acts, statutes, guidance, provisions, etc., and any decisions regarding the treatment of human remains will be made recognizing the rights of lineal descendants, Tribes, and other Native American Indians and under consultation with the State Historic Preservation Officer/Tribal Historic Preservation Officer(s) and the other consulting parties, designated Tribal Coordinator, and/or other appropriate legal authority for future and expedient disposition or curation. When finds of human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered or collected from Federal lands or federally-recognized tribal lands, the Corps will coordinate with the appropriate federally-recognized Native American Tribes, pursuant to the Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. § 3001 *et seq*.) and its implementing regulations (43 CFR Part 10).

Antiquities Act (16 U.S.C. 431 *et seq*.). The Antiquities Act protects historic and prehistoric ruins, monuments, and objects of antiquity (including paleontological resources) on lands owned or controlled by the Federal Government. If historic or prehistoric ruins or objects were found during the construction or operation of facilities associated with this project, the Corps would have to determine if adverse effects to these ruins or objects would occur. If adverse effects would occur, the Secretary of the Interior would have to grant permission to proceed with the activity (36 CFR Part 296 and 43 CFR Parts 3 and 7).

Indian Sacred Sites (EO 13007). This EO directs federal agencies, to the extent permitted by law and not inconsistent with agency missions, to avoid adverse effects to sacred sites and to provide access to those sites to Native Americans for religious practices. The Order directs agencies to plan projects to provide protection of and access to sacred sites to the extent compatible with the project. To preserve, conserve, and encourage the continuation of the diverse traditional prehistoric, historic, ethnic, and folk cultural traditions within the Illinois watershed, the Illinois River Basin Restoration will be implemented in compliance with EO 13007, specifically:

In order to preserve, conserve, and encourage the continuation of the diverse traditional prehistoric, historic, ethnic, and folk cultural traditions along UMR and IWW, the Navigation Study will be in compliance with Executive Order No. 13007, specifically:

> *Section 1. Accommodation of Sacred Sites*. (a) In managing Federal lands, each executive branch agency with statutory or administrative responsibility for the management of Federal lands shall, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites.
>
> The Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs pursuant to the National Historic Preservation Act states that a:
>
> *Traditional Cultural Property* is defined as a property that is associated with cultural practices or beliefs of a living community that (1) are rooted in that community's history, and (2) are important in maintaining the continuing cultural identity of the community.

In compliance with this Act, a Corps letter dated October 5, 2001 (appendix A) was sent via Distribution lists that contained a Consulting Parties List, comprised of 325 parties, including 47

federally-recognized Tribes or Tribal contacts. This correspondence also contained a *Traditional Cultural Property and Sacred Site Form***,**" to facilitate tribal coordination, the Corps requested the consulting parties List to refer to the National Park Service, NRHP Bulletin 38, *Guidelines for Evaluating and Documenting Traditional Cultural Properties*, available for Internet viewing at (http://www.cr.nps.gov/nr/publications/bulletins.htm). Locations of traditional cultural properties or sacred sites, consisting of architecture, landscapes, objects, or surface or buried archaeological sites, identified in this coordination effort, can be considered to be sensitive information, pursuant to Section 304 of the NHPA. Upon request from any consulting parties not to disclose locations or traditional cultural properties or sacred sites, the Corps and the Illinois DNR will secure this information from the general public.

No Consulting Parties, including Tribes identified traditional cultural properties or sacred sites within the Illinois River Basin within the State of Illinois and no *Traditional Cultural Property and Sacred Site Form* was completed and returned to the Corps. Therefore, the Illinois River Basin Restoration is perceived to have no potential to affect tribal lands, interfere with Federal trust responsibilities, or affect sites or areas of religious and cultural significance to any Native American Tribes. It is the intent of the Corps to accommodate and comply with Native American Tribes' access rights, maintain confidentiality, and avoid adversely affecting sacred sites and traditional cultural properties.

Consultation and Coordination with Indian Tribal Governments (EO 13175). This Executive Order directs Federal agencies to establish regular and meaningful consultation and collaboration with tribal governments in the development of Federal policies that have tribal implications, to strengthen United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates on tribal governments. The Corps and the Illinois DNR developed a preliminary Consulting Parties List. Those on the preliminary Consulting Parties List, comprised of 325 parties, including 47 federally-recognized Tribes or Tribal contacts, were provided an opportunity to comment on a draft of the PA by letter dated 5 October 2001 (appendix A). Although the Illinois River Basin Restoration predominantly lies within the State of Illinois, consulting parties from elsewhere in the United States are given equal and due consideration. Since the Corps remains unaware of any lands held in Federal trust or of any Federal trust responsibilities for Native American Indians within the Illinois River watershed, the Corps requested any information concerning our Federal trust responsibilities by 5 October 2001 letter**.** During this coordination, consulting parties were asked to participate in the development of a final consulting parties list (appendix A). Anyone, other consulting parties, Tribes, or Tribal Contacts can be included on the Final Consulting Parties upon request.

Allowing for tribal review and comment contributes to fulfilling obligations as set forth in the NHPA (PL 89-665), as amended**;** the National Environmental Policy Act of 1969 (PL 91-190)**;** EO 11593 for the "Protection and Enhancement of the Cultural Environment" (Federal Register, May 13, 1971)**;** the Archaeological and Historical Preservation Act of 1974 (PL 93-291)**;** the ACHP "Regulations for the Protection of Historic and Cultural Properties" (36 CFR, Part 800)**;** and the applicable National Park Service and Corps regulations.

Illinois Compiled Statutes: Human Skeletal Remains Protection Act (20 ILCS 3440/ 0.01 through 3440/ 3). This act declares that there is an immediate need to protect the graves of prehistoric and historic Indians, pioneers and Civil War veterans from persons engaged for personal or financial gain in the mining of such graves and to assure that all human burials be accorded equal treatment and respect for human dignity without reference to ethnic origins, cultural backgrounds or religious affiliations. Requires a person who discovers human skeletal remains to notify the coroner within forty-eight hours. Declares that a person who fails to do so shall be guilty of a class C

misdemeanor, unless the person has reasonable cause to believe that the coroner had already been notified. Directs the coroner to notify promptly the Historic Preservation Agency prior to the removal of any human skeletal remains that appear to be from an unregistered

Illinois Compiled Statues: Human Skeletal Remains Protection Act: permits; remains and artifacts held in trust; regulations; exemptions (20 ILCS 3440/13 through 3440/16). This act directs the Historic Preservation Agency to develop regulations, in consultation with the Illinois State Museum, for the issuance of permits for the removal of human skeletal remains and grave artifacts from unregistered graves or the removal of grave markers. Requires each permit to specify all terms and conditions under which the removal of human skeletal remains, grave artifacts or grave markers shall be carried out. Directs that all costs accrued in the removal of such materials shall be borne by the permit applicant. Requires the permit holder to submit a report of the results to the Historic Preservation Agency. Declares that all human skeletal remains and grave artifacts in unregistered graves are held in trust for the people of Illinois by the state and are under the jurisdiction of the Historic Preservation Agency. Directs that all materials collected under this act shall be maintained, with dignity and respect, for the people of the state under the care of the Illinois State Museum. Directs the Historic Preservation Agency to promulgate regulations to carry out the purposes of this act. Exempts from permitting requirements under this act or any law, rule or regulation adopted thereunder activities reviewed by the Historic Preservation Agency pursuant to Section 106 of the National Historic Preservation Act and activities permitted pursuant to the Federal Surface Mining Control and Reclamation Act of 1972.

Illinois Compiled Statues: Archeological and Paleontological Resources Protection Act (20 ILCS 3435/7). This statute requires all materials and associated records to remain the property of the state to be managed by the Illinois State Museum, Springfield, Illinois.

Clean Air Act of 1972, as amended. It is not anticipated that specific ecosystem restoration projects, planned and implemented under this systemic program document, would result in either short- or long-term violations to air quality standards. It is not anticipated that the outdoor atmosphere would be exposed to contaminants/pollutants in such quantities and of such duration as may be or tend to be injurious to human, plant, or property, or which unreasonably interferes with the comfortable enjoyment of life, or property, or the conduct of business. It is anticipated future projects would be in full compliance.

Clean Water Act of 1972 (Sections 401 and 404), as amended. Any and all specific ecosystem restoration projects, implemented under this systemic program, would address the impacts of placing dredged and/or fill material into the waters of the United States on an individual, site-specific basis in a separate NEPA document. State Water Quality Certification (Section 401) would be received prior to any specific project implementation.

Endangered Species Act of 1973, as amended. Coordination with appropriate Federal and State natural resource agencies for this report has resulted in an extensive list of endangered, threatened, or special concern species within the Illinois River Basin. Within the NEPA documents of all future ecosystem restoration projects under this authority, a full discussion of the project features and their potential impact on endangered, threatened, or special concern species would appear.

Fish and Wildlife Coordination Act of 1958, as amended. This Comprehensive Plan has been coordinated with the USFWS and the Illinois DNR. The District coordination letter (March 24, 2003) to the appropriate Federal and State agencies and all responses can be found in Section 7 of this report.

Any/all future restoration projects under this authority would accomplish compliance with the Fish and Wildlife Coordination Act within a separate NEPA document, specific to that project.

Rivers and Harbors Acts, as amended. It is not anticipated that future restoration projects would place any obstruction across navigable waters or place obstructions to navigation outside established lines. For any/all future restoration projects under Section 519, WRDA 2000 authority, compliance with all Sections of the River and Harbor Acts would be documented separately.

Wild and Scenic Rivers Act of 1968, as amended. The National Rivers Inventory (NRI) is used to identify rivers, or sections of rivers that may be designated by Congress to be component rivers in the National Wild and Scenic Rivers System. The following rivers/river sections or streams are listed in the National Rivers Inventory (NRI): Fox River, (Wisconsin) Elgin to W. Dundee dam, Algonquin to Wilmot dam, Wedron to Yorkville; Illinois River (Illinois), Pekin to Kickapoo Creek, Woodford-Tazewell County line to Chillicothe; Kankakee River, (Indiana) 12d boundary to Indiana State line; Mackinaw River, (Illinois) from confluence with Illinois River to Colfax; Mazon River, (Illinois) mouth to source; Sangamon River, (Illinois) nine sections (too numerous to mention); Spoon River, (Illinois) confluence with Iroquois River to 3 miles south of Onarga; Sugar Creek, (Indiana and Illinois) from confluence with Iroquois River, upstream approximately 36 miles to where channelization begins.

Executive Order 11988 (Flood Plain Management). Implementation of any/all future site-specific ecosystem restoration projects would avoid, to the extent possible, long- and short-term adverse impacts associated with the occupancy and modification of the base floodplain. They also would avoid direct and indirect support of development or growth (construction of structures and/or facilities, habitable or otherwise) in the base floodplain wherever there is a practicable alternative. In the separate NEPA documents associated with future site-specific restoration projects, additional evaluations would be performed to identify any changes to the 100-year flood profile. The Corps would obtain and adhere to all stipulations of the floodplain permit from the appropriate State agency prior to implementation of any/all site-specific restoration projects.

Executive Order 11990 (Protection of Wetlands). Any/all future restoration projects associated with this authority would address potential impacts to wetlands resulting from project features in a separate NEPA document. One of the primary objectives of any ecosystem restoration project(s) is to cause betterment to the environment (including wetlands). It is anticipated that any future site-specific ecosystem restoration project would not cause an overall degradation to wetlands.

Farmland Protection Policy Act, of 1981. It is well understood the prominent role that agriculture plays in the Illinois River Basin. It is important that all future restoration projects be designed and implemented in a manner that is as compatible as practicable with the agricultural community. Balancing environmental restoration goals with protecting the integrity of agricultural operations should be one of the guiding principles as we proceed with implementation of this Comprehensive Plan. Future site-specific restoration projects would be closely coordinated with agricultural groups and organizations. Unwarranted destruction and unnecessary conversion of farmland, particularly prime farmland, would be avoided. Any/all future site-specific projects that propose conversion of farmland would compile NEPA documents where appropriate Federal, State, and local agencies tasked with protecting farmland are consulted.

Federal Water Project Recreational Act, of 1965. Effort was not made to identify opportunities for recreational development or aspects of the alternatives conducive to recreational development. Recreational opportunities may result from implementation of this program, but would be incidental to

the achievement of the overarching goal of restoring and maintaining ecological integrity, including habitats, communities, and populations of native species, and the processes that sustain them. Should these opportunities be identified for future projects, they would be discussed in those projects' site-specific planning document with NEPA compliance.

Invasive Species (EO 13112). Efforts to monitor the introduction and spread of listed harmful and invasive species in the Illinois River basin are ongoing. The implementation of fish passage measures at dams could facilitate the spread of invasive species. Exotic fish considerations will be further coordinated as new information becomes available. Any future site-specific project that has management features that could lead to violations of the EO would be discussed in that projects planning document with NEPA compliance.

Administrative Procedures Act, of 1946. The Illinois River Basin Restoration project has complied with the provisions of this act through public meetings, newsletters, coordination, and the NEPA review process.

Safe Drinking Water Act. The Illinois River Basin Restoration project, if implemented, should result in improvements in water quality. This program should not degrade the basin's sources of drinking water, and should protect public health to the extent practicable.

Migratory Bird Treaty Act, as amended. The USFWS will review this Comprehensive Plan and future site-specific project planning documents with NEPA compliance, to determine whether any project's activities would comply with or violate the requirements of this Act.

Bald Eagle Protection Act, as amended. The USFWS will review this report and all subsequent planning documents of this Illinois River Basin Restoration report to determine whether any project's activities would violate this Act.

National Wildlife Refuge System Administration Act, of 1966. The USFWS will review the Illinois River Basin Restoration report and all site-specific project planning documents with NEPA compliance to determine compliance with this Act.

Responsibilities of Federal Agencies to Protect Migratory Birds (EO 13186). Numerous aspects of this ecosystem restoration program and subsequent site-specific project features should enhance migratory bird habitat and lead to positive impacts to bird populations.

Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898). Potential impacts of the alternative plans are not expected to result in a disproportionate burden, or benefit, on minority or low-income communities in the study area.